

Remarks/Arguments

With entry of this Amendment, claims 173, 175-222, 225, and 227-245 are pending in the instant application. Claims 173, 175, 182-186, 192-195, 200, 224, 227, and 229-233 have been amended herein, and new claims 234-245 have been added. There is replete support throughout the specification for the subject matter of these amended and new claims, and thus no new matter is introduced into the application by reason of these changes and/or additions. Claims 174, 223 and 226 have been canceled without prejudice or disclaimer herein. Claims 1-172 were previously cancelled without prejudice or disclaimer in a Preliminary Amendment dated September 30, 2003.

Claim Rejections under 35 U.S.C. Section 102

Claims 173, 174, 179, 181, 182, 186, 201, 203, 207, 214, and 223 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Eaton et al. U.S. Patent No. 6,760,245 ("Eaton"). With respect to amended claim 173 (and independent claims 224 and 234, and their respective dependent claims), Eaton does not disclose an electronic substrate having a plurality of semiconductor devices including a "thin film of nanowires deposited on the substrate," and "wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and drain contacts." Rather, Eaton discloses a crossed wire transistor device having a two dimensional array of FET's wherein each FET in the array includes a pair of crossed wires in which only a single wire (e.g., wires 42) in each FET forms the channel between any respective pair of source and drain ("S/D") regions of the FET (e.g., see Figures 3 and 4 therein). Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Eaton, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons. Claims 174 and 223 have been cancelled. It is thus respectfully requested that the rejection of these claims be withdrawn.

Claims 173-176, 185, 192, 195, 224-233 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Avouris et al. (USPAP 2004/0061422) ("Avouris"). With respect to amended independent claims 173 and 224 (and new independent claim 234), Avouris does not disclose an electronic substrate, or a method of making same, having a plurality of semiconductor devices including a thin film of nanowires deposited on the substrate, and "wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and drain contacts." Rather, Avouris, for example, discloses a light emitting device that includes a single carbon nanotube (or a boron nitride nanotube) in each disclosed field effect device structure (e.g., see Avouris at paragraphs [0032], [0035] and [0038]); "The prototype device comprises a single carbon nanotube in a field effect structure. (See FIG. 1)." Para. [0038]. Accordingly, it is believed that independent claims 173 and 224 (and new independent claim 234) are patentable in view of Avouris, and withdrawal of the rejection of these claims is respectfully requested. Dependent claims 175-222, 225 and 227-233, and 235-245 each depend, directly or indirectly, from one of these independent claims, and are believed to be allowable for at least these same reasons. Claims 174 and 226 have been cancelled. It is thus respectfully requested that the rejection of these claims be withdrawn.

Claims 173, 174, 183-184, 193, 194, and 200 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Lieber et al. (USPAP 2002/0117659) ("Lieber"). With respect to amended independent claim 173 (and independent claims 224 and 234), Lieber does not disclose an electronic substrate having a plurality of semiconductor devices including a "thin film of nanowires deposited on the substrate," and "wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and drain contacts." Although Lieber generally discloses a nanoscale electrical device which may include a plurality of nanowires (e.g., paragraphs [0132] and [0143], for example), each individual wire (e.g., wires 38a-h in Figure 1b, not shown) in the device is individually connected (e.g., via wire interconnects 40a-h, respectively, in Figure 1b, not shown) to a separate electrical connection (e.g., electrical connections 22a-h, respectively, in Figure 1b, not shown),

thereby permitting each wire, which has a unique reaction entity coupled to it, to selectively detect the presence of a different analyte in a sample fluid (e.g., see paragraph [0143]) from every other wire. Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Lieber, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons.

Claims 173, 178, 197-199, 201, 202, 205, 206, 218, 220 and 222 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Majumdar et al. (USPAP 2002/0175408) ("Majumdar"). With respect to amended independent claim 173 (and independent claims 224 and 234), Majumdar does not disclose an electronic substrate having a plurality of semiconductor devices including a "thin film of nanowires deposited on the substrate," and "wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and drain contacts." For example, Majumdar does not teach or suggest a thin film of nanowires deposited on a device substrate; rather, individual nanowires 252 described in paragraphs [0165] through [0168] and shown in Figure 31, for example, are grown directly on the device substrate 218 (e.g., see paragraph [0165]). Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Majumdar, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons.

Claims 173, 180, 187-190, 196, 210, 204, 205, 208, 215-217, and 219 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Li et al. (USPAP 2003/0189202) ("Li"). With respect to amended independent claim 173 (and independent claims 224 and 234), Li does not disclose an electronic substrate having a plurality of semiconductor devices including a "thin film of nanowires deposited on the substrate," and "wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and

drain contacts.” For example, Li does not disclose a thin film of nanowires deposited on a device substrate; instead, nanowires 34 described therein are grown directly on electrodes 14 of the devices 12. Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Li, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons.

Claims 173, 175, 177, 190, 191, and 209-213 were rejected under 35 U.S.C. Section 102(b) as being anticipated by Russell et al. U.S. Patent No. 5,962,863 (“Russell”). With respect to amended claim 173 (and independent claims 224 and 234), Russell does not disclose an electronic substrate having a plurality of semiconductor devices including a “thin film of nanowires deposited on the substrate,” and “wherein at least two or more nanowires within said thin film of nanowires form a conducting channel between each of said respective pairs of source and drain contacts.” For example, in Russell, as shown in Figure 4, single planar nanostructure 140 is formed directly on insulating substrate 150 by standard lithography (e.g., see Abstract), and is not deposited in a thin film thereon. There is no disclosure of a semiconductor device having two or more nanowires within a thin film forming a channel between a respective pair of source and drain contacts of the device. Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Russell, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons.

Claims 173, 218 and 221 were rejected under 35 U.S.C. Section 102(b) as being anticipated by Kuekes et al. U.S. Patent No. 6,256,767 (“Kuekes”). With respect to amended claim 173 (and independent claims 224 and 234 and their respective dependent claims), Kuekes, similar to Eaton above, does not disclose an electronic substrate having a plurality of semiconductor devices including a “thin film of nanowires deposited on the substrate,” and “wherein at least two or more nanowires within said thin film of

nanowires form a conducting channel between each of said respective pairs of source and drain contacts.” Rather, Kuekes discloses a molecular wire cross bar network having a two dimensional array of nanometer-scale switches 10 wherein each switch in the array includes a pair of crossed wires 12, 14, wherein only one wire of each switch 10 comprises the “source” and “drain” and the other wire induces the “gate” function:

“One functionalized wire may comprise doped semiconductor, such as silicon, and the other functionalized wire may comprise a metal. Here, the doped silicon wire comprises the "source" and "drain" and the metal wire induces the "gate" function on the doped silicon wire where the wires cross, between the source and drain, to form a field effect transistor. The "gate" region is always modulation doped in this invention. Both n-channel and p-channel transistors that are analogous to field effect transistors may be formed in this fashion.”
Col. 8, lines 39-48.

Accordingly, it is believed that independent claim 173 (and independent claims 224 and 234) is patentable in view of Kuekes, and withdrawal of the rejection of this claim is respectfully requested. Dependent claims 175-222 (and 225, 227-233 and 235-245) each depend, directly or indirectly, from an allowable independent claim, and are believed to be allowable for at least these same reasons.

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Amnd dated October 12, 2004
Reply to Office Action of September 29, 2004

Conclusion

In view of the foregoing amendments and remarks, Applicants believe that the present application is in condition for allowance and action toward that end is respectfully requested. If the Examiner believes that a telephone interview would expedite the examination of this application, the Examiner is requested to contact the undersigned at the telephone number below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Andrew L. Filler", with a long horizontal flourish extending to the right.

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